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| FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413 | | | EXAMINER MARTEN, JERROD B | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/548,313

Applicant(s)

IKI ET AL.

Examiner

JERROD B. MARTEN

Art Unit

4153

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/92)
Paper No(s)/Mail Date 3/22/2006 & 08/16/2007
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. (US 6,251,262) in view of Waku et al. (US 5,741,414).

In regard to claim 1, Hatanaka discloses a gas oil fraction hydrotreatment process (Abstract) comprising:

- providing a gas oil fraction with a sulfur content of 0.8-2 % by mass (col. 9, line 50, 1.4%)
- a total aromatic content of 20-35 % by volume as a feed oil volume (see col. 9, line 49, where "Middle East straight run gas oil" is considered to be the same as the "straight run gas oil fraction obtained from Middle East crude oil" as characterized in Table 1 of the instant application)
- subjecting said feed oil to a hydrotreatment in the presence of a hydrogenation catalyst comprising at least one metal from among Group 6A metals and at least one metal from among Group 8 metals as active metals (see col. 4, lines 51-55)
- under reaction conditions with a reaction temperature of 330-390°C (see col. 10, line 53, 360°C) in presence of H₂ (see col. 10, lines 53-54)
- a liquid hourly space velocity of 0.1-1 h⁻¹ (see col. 10, line 54, 1 h⁻¹)
- to obtain an ultralow sulfur gas oil fraction (see col. 10, line 55, 0.004 wt% or 4 ppm)

Hatanaka et al. does not explicitly disclose the process wherein the hydrogen partial pressure is in the range 12-20 MPa. As the extent of heteroatom removal and degree of hydrogen saturation, are variables that can be modified, among others, by

adjusting the hydrogen partial pressure of the reactor with extent of heteroatom removal and degree of hydrogen saturation increasing as hydrogen partial pressure increases, the hydrogen partial pressure of the reactor would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed hydrogen partial pressure cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the hydrogen partial pressure in Hatanaka et al. to obtain the desired extent of heteroatom removal and hydrogen saturation (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Further, Hatanaka et al. does not explicitly disclose the produced oil fraction having a sulfur content of not greater than 1ppm by mass and a total aromatic content of not greater than 1%, however it is expected that the ultralow sulfur gas oil claimed in the instant claims would be produced by the process as Hatanaka et al. is using similar feed, catalyst, and operating conditions as claimed in the instant application.

In regard to claim 2, Hatanaka et al. discloses all claim limitations as set forth above. Hatanaka et al. discloses a gas oil fraction hydrotreatment process wherein:

- said feed oil has a monocyclic aromatic content of 9-19 % by volume, a bicyclic aromatic content of 8-13 % by volume and a tricyclic or greater aromatic content of 0.5- 4 % by volume (see col. 9, line 49, where "Middle

East straight run gas oil" is considered to be the same as the "straight run gas oil fraction obtained from Middle East crude oil" as characterized in Table 1 of the instant application)

In regard to claim 3, Hatanaka et al. discloses all claim limitations as set forth above. Further, Hatanaka et al. discloses a gas oil fraction hydrotreatment process comprising:

- a ratio of said feed oil and the a hydrogen gas co-fed (hydrogen/oil ratio) for said hydrotreatment is 300-900 NL/L. (see col. 10, lines 50-54, 2000scfb, which is 356.2 NL/L)

In regard to claim 5, Hatanaka et al. discloses all claim limitations as set forth above. Further, Hatanaka et al. discloses a gas oil fraction hydrotreatment process wherein:

- said feed oil has a paraffin content of 30-60 % by volume (see col. 9, line 49, where "Middle East straight run gas oil" is considered to be the same as the "straight run gas oil fraction obtained from Middle East crude oil" as characterized in Table 1 of the instant application)

Hatanaka et al. does not explicitly disclose that the feed oil has a naphthene content of 25-60% by volume, however the reference does disclose a feed with a naphthene content of approximately 22% by volume (see col. 9, line 49, where "Middle East straight run gas oil" is considered to be the same as the "straight run gas oil fraction obtained from Middle East crude oil" as characterized in Table 1 of the instant application). Although, Hatanaka et al. does not explicitly disclose a feed with a

naphthene range as claimed (25-60% by volume), the reference does disclose a feed with a naphthene content which would have been considered by one of ordinary skill in the art to be sufficiently close to the claimed range as to achieve similar results as Hatanaka et al. is using a similar catalyst and operating conditions as set forth above. Further, the instant application discloses using a feed with the same naphthene content of Hatanaka et al. while achieving the desired product composition.

Further, Hatanaka does not explicitly disclose that the ultralow sulfur and low aromatic gas oil fraction has a paraffin content of 30-60% by volume and a naphthene content of 40-70% by volume. However, it would be obvious to one of ordinary skill in the art to expect that the process of modified Hatanaka et al. would be capable of producing the ultralow sulfur and low aromatic gas fraction as claimed because the reference discloses all of the elements of the process including feed characteristics, operating conditions, and catalyst, as set forth above.

In regard to claim 6, modified Hatanaka et al. discloses all claim limitations as set forth above. Further, it is expected that the product obtained from hydrotreating in modified Hatanaka et al. would be capable of producing a yield of fractions having a lower boiling point than the boiling point of said feed oil in said hydrotreatment is not greater than 50 % by volume of the total feed oil, as Hatanaka et al. discloses all elements of the process including feed characteristics, operating conditions, and catalyst, as set forth above.

In regard to claim 7, modified Hatanaka et al. discloses all claim limitations as set forth above. Further, Hatanaka et al. discloses a gas oil hydrotreatment process wherein:

- hydrogenation catalyst is one having at least one type of metal from among Group 6A metals and at least one type of metal from among Group 8 metals as active metals supported on a porous support. (see col. 4, lines 46-48, lines 51-55 and col. 9, lines 33-45)

In regard to claim 8, modified Hatanaka et al. discloses all claim limitations as set forth above. Further, Hatanaka et al. discloses a gas oil hydrotreatment process wherein:

- said active metals are any combination selected from the group consisting of cobalt-molybdenum, nickel-molybdenum, nickel-tungsten and cobalt-nickel-molybdenum. (see col. 9, lines 33-45)

In regard to claim 9, modified Hatanaka et al. discloses all claim limitations as set forth above. Further, Hatanaka et al. discloses a gas oil hydrotreatment process wherein:

- a total amount of said active metals in said hydrogenation catalyst being at least 22 % by mass of the total catalyst, in terms of oxides. (see col. 9, lines 33-45, 25 wt% cobalt-molybdenum and 23 wt% nickel-molybdenum).

In regard to claims 10 and 11, modified Hatanaka et al. discloses all claim limitations as set forth above. Hatanaka et al. does not explicitly disclose the gas oil hydrotreatment process wherein the ultralow sulfur and low aromatic gas oil fraction

does not contain greater than 1 ppm sulfur and not great than 1% aromatics. However, it would be obvious to one of ordinary skill in the art to expect that the process of Hatanaka et al. would be capable of producing the ultralow sulfur and low aromatic gas fraction as claimed because the reference discloses all of the elements of the process including feed characteristics, operating conditions, and catalyst, as set forth above.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. (US 6,251,262) as applied to claim 1 above, in view of Waku et al. (US 5,741,414).

In regard to claim 4, modified Hatanaka et al. discloses all claim limitations as set forth above. Further, Hatanaka et al. discloses a gas oil fraction hydrotreatment process wherein:

- said hydrotreatment is carried out in a hydrotreatment apparatus provided with at least one reactor (col. 9, lines 30-45, where there is one reactor divided into 3 catalytic zones)

Hatanaka et al. does not explicitly disclose that the volume of hydrogen gas supplied at the inlet of the reactor is not greater than 60% by volume of the total hydrogen gas supplied to the process.

Waku et al. teaches a gas oil fraction hydrotreatment process wherein:

- the volume of hydrogen gas supplied at the inlet of the reactor into which said feed oil is initially introduced, of the hydrogen gas accompanying the feed oil for said hydrotreatment, is not greater than 60 % by volume of the total hydrogen gas supply volume. (see Table 2, col. 7, lines 7-10 and lines 24-26,

where only 50% of the total hydrogen gas supply is injected into the feedstock.)

Hatanaka et al. and Waku et al. are analogous as both references are drawn to desulfurizing and reducing the aromatic content of a gas oil feedstock using a hydrotreating reactor.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the desulfurization process of Hatanaka et al. using the method of injecting hydrogen into each stage of the hydrotreating process as taught by Waku et al. to achieve higher levels of desulfurization and aromatic reduction of the feedstock gas oil, increase reaction efficiency, and remove hydrogen sulfide gas from the effluent exiting the first reaction zone.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claim 10 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 8 of copending Application No. 10/548,315. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are product-by-process claims that claim identical products where the products are an ultra low sulfur and low aromatic gas oil fraction having a sulfur content not great than 1ppm by mass and a total aromatic content of not greater than 1% by volume.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. Claim 11 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 9 of copending Application No. 10/548,315. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are both product-by-process claims that claim identical products where the product is a gas oil fraction having a sulfur content not great than 1ppm by mass and a total aromatic content of not greater than 1% by volume..

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERROD B. MARTEN whose telephone number is (571)270-7066. The examiner can normally be reached on Mon.-Thurs., 7:30 a.m.-5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571)272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B. M./
Examiner, Art Unit 4153

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 4153